

**ADVANCED  
POWER  
TECHNOLOGY®**  
APT2X30D30J 300V 30A  
APT2X31D30J 300V 30A

## DUAL DIE ISOTOP® PACKAGE

## ULTRAFast SOFT RECOVERY DUAL RECTIFIER DIODES

PRODUCT APPLICATIONS	PRODUCT FEATURES	PRODUCT BENEFITS
<ul style="list-style-type: none"> <li>• Anti-Parallel Diode               <ul style="list-style-type: none"> <li>-Switchmode Power Supply</li> <li>-Inverters</li> </ul> </li> <li>• Free Wheeling Diode               <ul style="list-style-type: none"> <li>-Motor Controllers</li> <li>-Converters</li> </ul> </li> <li>• Snubber Diode</li> <li>• Uninterruptible Power Supply (UPS)</li> <li>• Induction Heating</li> <li>• High Speed Rectifiers</li> </ul>	<ul style="list-style-type: none"> <li>• Ultrafast Recovery Times</li> <li>• Soft Recovery Characteristics</li> <li>• Popular SOT-227 Package</li> <li>• Low Forward Voltage</li> <li>• High Blocking Voltage</li> <li>• Low Leakage Current</li> </ul>	<ul style="list-style-type: none"> <li>• Low Losses</li> <li>• Low Noise Switching</li> <li>• Cooler Operation</li> <li>• Higher Reliability Systems</li> <li>• Increased System Power Density</li> </ul>

### MAXIMUM RATINGS

All Ratings are per diode:  $T_C = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Characteristic / Test Conditions	APT2X30/2X31D30J	UNIT
$V_R$	Maximum D.C. Reverse Voltage	300	Volts
$V_{RRM}$	Maximum Peak Repetitive Reverse Voltage		
$V_{RWM}$	Maximum Working Peak Reverse Voltage		
$I_F(AV)$	Maximum Average Forward Current ( $T_C = 100^\circ\text{C}$ , Duty Cycle = 0.5)	30	Amps
$I_F(RMS)$	RMS Forward Current	70	
$I_{FSM}$	Non-Repetitive Forward Surge Current ( $T_J = 45^\circ\text{C}$ , 8.3ms)	320	
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_L$	Lead Temperature: 0.063" from Case for 10 Sec.	300	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$V_F$	Maximum Forward Voltage	$I_F = 30\text{A}$		1.4	Volts
		$I_F = 60\text{A}$		1.4	
		$I_F = 30\text{A}, T_J = 150^\circ\text{C}$		1.2	
$I_{RM}$	Maximum Reverse Leakage Current	$V_R = V_R$ Rated		250	$\mu\text{A}$
		$V_R = V_R$ Rated, $T_J = 125^\circ\text{C}$		500	
$C_T$	Junction Capacitance, $V_R = 200\text{V}$		71		pF
$L_S$	Series Inductance (Lead to Lead 5mm from Base)		10		nH

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**DYNAMIC CHARACTERISTICS**

**APT2X30/2X31D30J**

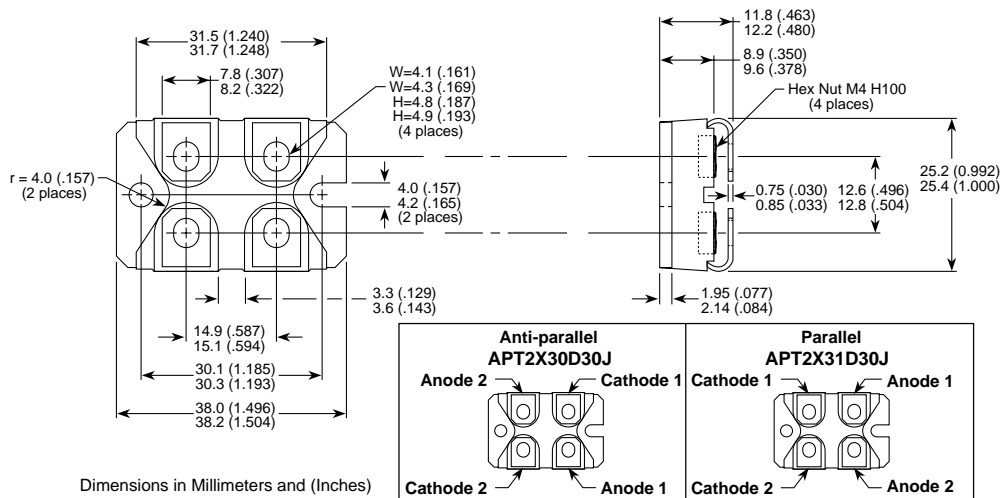
Symbol	Characteristic	MIN	TYP	MAX	UNIT
$t_{rr1}$	Reverse Recovery Time, $I_F = 1.0A$ , $di_F/dt = -15A/\mu s$ , $V_R = 30V$ , $T_J = 25^\circ C$		35	TBD	ns
$t_{rr2}$	Reverse Recovery Time	$T_J = 25^\circ C$	40		
$t_{rr3}$	$I_F = 30A$ , $di_F/dt = -100A/\mu s$ , $V_R = 180V$	$T_J = 100^\circ C$	60		
$t_{fr1}$	Forward Recovery Time	$T_J = 25^\circ C$	162		
$t_{fr2}$	$I_F = 30A$ , $di_F/dt = 100A/\mu s$ , $V_R = 180V$	$T_J = 100^\circ C$	162		
$I_{RRM1}$	Reverse Recovery Current	$T_J = 25^\circ C$	5	9	Amps
$I_{RRM2}$	$I_F = 30A$ , $di_F/dt = -100A/\mu s$ , $V_R = 180V$	$T_J = 100^\circ C$	8	16	
$Q_{rr1}$	Recovery Charge	$T_J = 25^\circ C$	110		nC
$Q_{rr2}$	$I_F = 30A$ , $di_F/dt = -100A/\mu s$ , $V_R = 180V$	$T_J = 100^\circ C$	280		
$V_{fr1}$	Forward Recovery Voltage	$T_J = 25^\circ C$	2.9		Volts
$V_{fr2}$	$I_F = 30A$ , $di_F/dt = 100A/\mu s$ , $V_R = 180V$	$T_J = 100^\circ C$	2.9		
$diM/dt$	Rate of Fall of Recovery Current	$T_J = 25^\circ C$	317		A/ $\mu s$
		$T_J = 100^\circ C$	550		

**THERMAL AND MECHANICAL CHARACTERISTICS**

Symbol	Characteristic / Test Conditions	MIN	TYP	MAX	UNIT
$R_{\theta JC}$	Junction-to-Case Thermal Resistance			1.1	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient Thermal Resistance			20	
$V_{Isolation}$	RMS Voltage (50-60 Hz Sinusoidal Waveform from Terminals to Mounting Base for 1 Min.)	2500			Volts
$W_T$	Package Weight		1.03		oz
			29.2		gm
Torque	Maximum Torque (Mounting = 8-32 or 4mm Machine and Terminals = 4mm Machine)			13.6	lb•in
				1.5	N•m

APT Reserves the right to change, without notice, the specifications and information contained herein.

**SOT-227 Package Outline**



053-4055 Rev - 6-2001

APT's devices are covered by one or more of the following U.S. patents:  
ISOTOP® is a Registered Trademark of SGS Thomson.

4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336  
5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058